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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,606	02/06/2002	Tsunenobu Hori	2635-94	4485
23117	7590	04/20/2004	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			WILLIAMS, JOSEPH L	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/066,606	Applicant(s) HORI ET AL.	
	Examiner Joseph L. Williams	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13, 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed on 28 January 2004 has been entered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5, 7, 10, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Osamura et al. (US 5,977,695).

Regarding claim 1, Osamura ('695) teaches in figures 2 and 4a a spark plug comprising: a center electrode having a tip; a ground electrode having a center electrode-opposed surface facing the tip of the center electrode; a noble metal member having a given length and a first and a second end opposed to each other through the length, the noble metal member being joined at the first end to the center electrode-opposed surface of the ground electrode by welding so as to oppose the second end to the tip of the center electrode a fused portion that forms a weld of the noble metal member and the ground electrode formed by materials of the ground electrode and the noble metal member melted together, wherein a sectional area of the noble metal member traversing the length thereof is greater than or equal to 0.1 mm² and smaller than or equal to 0.6mm², wherein an unfused sectional area percentage that is a percentage of a sectional area of an unfused portion of the first end of the noble metal

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member within a range of a sectional area of the noble metal member closest to the fused portion traversing the length of the noble metal member is less than or equal to 50%, and wherein a melt angle that is an angle which a line extending through the fused portion along a maximum depth of the fused portion makes with the center electrode-opposed surface of the ground electrode is less than or equal to 60°.

Further regarding claim 1, the Examiner notes that the claim limitation of the noble metal member being joined by laser welding is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Regarding claim 2, Osamura ('695) teaches a spark plug wherein if a point at which the line extending along the maximum depth of the fused portion intersects an outer surface of the fused portion is defined as an intersection F, and a distance between the intersection F and the center electrode-opposed surface of the ground electrode is defined as an intersection to surface distance y, the intersection F is located within a range of -0.2mm to 0.3mm where when the intersection F is located outside the center electrode-opposed surface of the ground electrode, the intersection-to-surface distance y is expressed in a plus value (+), and when the intersection F is located inside

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the center electrode-opposed surface of the ground electrode, the intersection-to-surface distance y is expressed in a minus value (-), and wherein the melt angle is less than or equal to $(30 + 100y)^\circ$.

Regarding claim 4, Osamura ('695) teaches (see table) the noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

Regarding claim 5, Osamura ('695) teaches in figure 2 a spark plug comprising: a metal shell; a center electrode retained in the metal shell to be insulated from the metal shell, the center electrode having a tip exposed outside the metal shell; a ground electrode installed on the metal shell, the ground electrode having a tip which has a center electrode-opposed side surface facing the tip of the center electrode and an end surface; and the end surface of the ground electrode and joined to the ground electrode by welding through a fused portion that forms a weld of the noble metal member and the ground electrode formed by materials of the ground electrode and the noble metal member melted together, the noble metal member having a tip projecting from the center electrode-opposed side surface of the ground electrode toward the center electrode so as to define a spark gap between the tip of the noble metal member and the tip of the center electrode.

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Further regarding claim 5, the Examiner notes that the claim limitation of the noble metal member being joined by laser welding is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Regarding claim 7, Osamura ('695) teaches the noble metal chip has a length, and a sectional area of the noble metal member traversing the length thereof is greater than or equal to 0.1 mm^2 and smaller than or equal to 0.6 mm^2 .

Regarding claim 10, Osamura ('695) teaches (see table) the noble metal member is made from one of a first material containing a main component of 50Wt% or more of Pt and an additive of at least one of Rh, Ir, Os, Ni, W, Pd, and Ru and a second material containing a main component of 50Wt% or more of Ir and an additive of at least one of Rh, Pt, Os, Ni, W, Pd, and Ru.

Regarding claims 13 and 14, Osamura ('695) teaches a metal shell having a thread formed in an outer periphery thereof, a porcelain insulator (read alumina ceramic) installed in the metal shell to have a tip projecting from an end of said metal shell, said porcelain insulator having a length and an inner chamber extending along the

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length thereof, wherein said center electrode is disposed within the inner chamber of said center electrode to have a tip projecting from the tip of said porcelain insulator, and wherein the ground electrode has an L-shape which includes a base end welded to the end of the metal shell and a tip, the tip of the ground electrode having a side surface defining the center electrode-opposed surface which faces the tip of the center electrode through the spark gap.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamura et al. (US 5,977,695), of record, in view of Matsutani (US 6,597,089).

Regarding claim 3, Osamura ('695) teaches all of the claimed limitations except for a width of a portion of the noble metal member closest to the fused portion is defined as D, the maximum depth of the fused portion is less than or equal to 1.4D.

Matsutani ('089) teaches in figure 2 a spark plug comprised of, in part, a width of a portion of the noble metal member closest to the fused portion is defined as D, the maximum depth of the fused portion is less than or equal to 1.4D, for the purpose of maintaining excellent spark plug performance over a long period of time.

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the noble metal dimensions of Matsutani in the spark plug of Osamura for the purpose of maintaining excellent spark plug performance over a long period of time.

Regarding claim 6, Osamura ('695) teaches all of the claimed limitations except for a width of a portion of the noble metal member closest to the fused portion in a direction perpendicular to the end surface of the ground electrode is defined as D1, a depth of a portion of the noble metal member embedded in the end surface of the ground electrode is greater than or equal to 0.5D1.

Matsutani ('089) teaches in figure 2 a spark plug comprised of, in part, a width of a portion of the noble metal member closest to the fused portion in a direction perpendicular to the end surface of the ground electrode is defined as D1, a depth of a portion of the noble metal member embedded in the end surface of the ground electrode is greater than or equal to 0.5D1.

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the noble metal dimensions of Matsutani in the spark plug of Osamura for the purpose of maintaining excellent spark plug performance over a long period of time.

Regarding claim 8, Matsutani ('089) teaches a width of a portion of the noble metal member closest to the fused portion in a direction perpendicular to the end

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surface of the ground electrode in a direction parallel to the end surface of the ground electrode is defined as D_2 , a width of the fused portion is defined as N , and a maximum depth of the fused portion is defined as H , the maximum depth H is smaller than or equal to $2D_1$, and the width N is smaller than or equal to $2.5D_2$.

The reason for combining is the same as for claim 6 above.

Regarding claim 9, Matsutani ('089) teaches a depth of a portion of the noble metal member embedded in the end surface of the ground electrode is greater than or equal to $0.5D_1$.

The reason for combining is the same as for claim 6 above.

Response to Arguments

3. Applicant's arguments with respect to claims 1-10, 13, and 14 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Williams whose telephone number is (571) 272-2465. The examiner can normally be reached on M-F (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph Williams

**Examiner
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